

IN THE CLAIMS:

- 1 1. (Currently amended) A data collection apparatus, comprising:
- 2 a sensing unit for ~~attaching to a structure or live subject~~ for sensing a
- 3 parameter of the ~~structure or live subject~~, said sensing unit comprising a
- 4 sensor, a first data storage device, a first receiving device, and a first
- 5 transmitting device, said first data storage device for storing data from said
- 6 sensor, said first transmitting device for transmitting data derived from
- 7 said sensor;
- 8 a control unit separable from said sensing unit, said control unit
- 9 comprising a data receiving device, a second transmitting device, and a
- 10 second data storage device different from said first data storage device,
- 11 said data receiving device to receive data transmitted from said data
- 12 sensing unit, said second data storage device for storing said data received
- 13 from said sensing unit wherein said sensing unit is configured so a real
- 14 time signal from said control unit to said sensing unit can trigger a change
- 15 in one or more of the following: (a) sensor data handling, (b) sensor data
- 16 collection, and (c) sensor data storage in said sensing unit, and (d) sensor
- 17 data transmission from said sensing unit; and
- 18 a ~~triggering device for modifying the storing of data being stored to said~~
- 19 ~~first data storage device or for initiating transmission of data from said~~
- 20 ~~sensing unit to said control unit, wherein said triggering device is~~
- 21 ~~controlled by a real time change in information about the structure or live~~
- 22 ~~subject.~~

1 2. (Currently amended) The apparatus as recited in claim 1, wherein said sensor
2 comprises an accelerometer, a displacement sensor, a strain gauge, a pressure
3 gauge, a thermometer, a flow monitor, a heart monitor, an EKG, an EMG, an
4 EEG, a blood monitor, a force gauge, a humidity monitor, a growth rate monitor, a
5 ripeness monitor, a light intensity gauge, a radiation detector, a chemical detector,
6 a corrosion detector, or a toxic monitor.

1 3. (Currently amended) The apparatus as recited in claim 2, wherein said sensor
2 comprises an array of said accelerometers.

1 4. (Currently amended) The apparatus as recited in claim 2, wherein said sensor
2 comprises a linear ~~or angular~~ accelerometer.

1 5. (Currently amended) The apparatus as recited in claim 2, wherein said sensor
2 comprises a resistive accelerometer ~~or a piezoelectric~~ accelerometer.

1 6. (Original) The apparatus as recited in claim 1, wherein said sensor is for detecting
2 vibration.

1 7. (Original) The apparatus as recited in claim 1, wherein said sensing unit is for
2 attaching to an architectural structure or to a vehicle.

1 8. (Currently amended) The apparatus as recited in claim 1, wherein said data
2 sensing unit is for wearing by the a live subject.

1 9. (Currently amended) The apparatus as recited in claim 1, wherein said data
2 sensing unit is for implanting in the a live subject.

- 1 10. (Currently amended) The apparatus as recited in claim 9, further comprising a
2 hermetically sealed housing, wherein said ~~sensor~~ sensing unit is located in said
3 sealed housing.
- 1 11. (Original) The apparatus as recited in claim 10 wherein said housing comprises
2 titanium or ceramic.
- 1 12. (Currently amended) The apparatus as recited in claim 10, wherein said sensing
2 unit further comprises an antenna, wherein ~~an~~ said antenna extends outside said
3 housing and is connected to ~~a receiver or transmitter~~ within said housing through
4 a penetration in said housing.
- 1 13. (Currently amended) The apparatus as recited in claim 1, wherein said sensing
2 unit further comprising comprises a microprocessor.
- 1 14. (Currently amended) The apparatus as recited in claim 13, wherein said
2 microprocessor is ~~in said sensor unit and wherein~~ connected to said first storage
3 device, said first transmitting device, and said first receiving device is connected
4 ~~to said receiver and to said sensor through said microprocessor.~~
- 1 15. (Currently amended) The apparatus as recited in claim 13, wherein said
2 microprocessor comprises ~~said a~~ triggering device for triggering said change.
- 1 16. (Currently amended) The apparatus as recited in claim 1, wherein said ~~sensor~~
2 sensing unit further comprises a power supply.
- 1 17. (Currently amended) The apparatus as recited in claim 16, wherein said power
2 supply comprises one or more from the group consisting of a rechargeable battery
3 or and a fuel cell.

- 1 18. (Original) The apparatus as recited in claim 17, further comprising a circuit for
2 recharging said battery by inductive coupling.
- 1 19. (Original) The apparatus as recited in claim 18, further comprising a hermetically
2 sealed housing, wherein said sensor and said circuit for recharging is in said
3 housing and said coupling is through said housing.
- 1 20. (Currently amended) The apparatus as recited in claim 18, wherein said circuit for
2 recharging is in the said housing and an antenna for said the coupling is located
3 outside the said housing.
- 1 21. (Currently amended) The apparatus as recited in claim 1, wherein said ~~sensing~~
2 ~~unit further~~ first receiving device comprises an RF receiver for receiving a said
3 real time signal from said triggering device.
- 1 22. (Currently amended) The apparatus as recited in claim 1, wherein said first
2 transmitting device is includes an RF transmitter.
- 1 23. (Currently amended) The apparatus as recited in claim 1, wherein said sensing
2 unit includes a clock, wherein said control unit includes a time reference, and
3 wherein said second transmitting device is capable of sending a timing signal to
4 said sensor unit for synchronizing said clock to said time reference.
- 1 24. (Currently amended) The apparatus as recited in claim 23, wherein a plurality of
2 sensing units includes clocks, wherein said timing signal is for synchronizing
3 synchronizes said clocks on a plurality of said sensing units sensors or for
4 synchronizing a sensor with another apparatus.

1 25. (Original) The apparatus as recited in claim 23, wherein said first storage device is
2 connected to receive and record said timing signal.

1 26. (Original) The apparatus as recited in claim 1, wherein said first data storage
2 device continually records.

1 27. Cancel

1 28. (Currently amended) The apparatus as recited in claim ~~27~~ 77, wherein when said
2 data received by said sensor reaches a threshold, data in said first storage device is
3 retained.

1 29. (Original) The apparatus as recited in claim 28, wherein said retained data
2 includes data received after said sensor reaches said threshold.

1 30. (Currently amended) The apparatus as recited in claim 1, wherein said sensing
2 unit further comprising includes a feedback device for adjusting said parameter
3 based on said data.

1 31. (Cancel)

1 32. (Currently amended) The apparatus as recited in claim 30, further comprising a
2 sensor capable of detecting excessive vibration, wherein said feedback device is
3 an active damping element to reduce vibration in response to measured excessive
4 vibration.

1 33. (Cancel)

1 34. (Original) The apparatus as recited in claim 1, wherein said second data storage
2 device comprises a computer.

1 35. (Original) The apparatus as recited in claim 1, wherein said control unit ~~further~~
2 comprises a device to signal a user that data exceeding a preset threshold ~~has been~~
3 reached.

1 36. (Cancel)

1 37. (Cancel)

1 38. (Currently amended) The apparatus as recited in claim 1, further comprising a
2 plurality of sensing units, wherein said ~~control unit is capable of sending second~~
3 transmitting device is connected to transmit address information to said ~~sensor~~
4 sensing units ~~unit~~ to activate all of said sensing units, to activate specific ones of
5 said sensing units, or to communicate with an individual sensor sensing unit of a
6 said plurality of sensor sensing units.

1 39. (Currently amended) A method of collecting data, comprising the steps of:

2
3 a) providing a sensing unit ~~for attaching to a structure or live subject~~
4 for sensing a parameter ~~of the structure or live subject~~, said sensing
5 unit comprising a sensor, a first data storage device, a first
6 receiving device, and a first transmitting device, said first data
7 storage device for storing data from said sensor, said first
8 transmitting device for transmitting data derived from said sensor;

9 b) providing a control unit separable from said sensing unit, said
10 control unit comprising a second data receiving device and a
11 second data storage device different from said first storage device,
12 said second data receiving device to receive data transmitted from
13 said data sensing unit, said second data storage device for storing
14 said data received from said sensing unit; and

15 c) transmitting a real time signal to said first receiving device to
16 trigger a change in one or more of the following: sensor data
17 handling, sensor data collection, and storage of sensor data in said
18 first sensing unit; and

19 d) triggering transmitting data from said first sensing unit to said data
20 receiving device.

21 ~~c) providing a trigger signal for modifying the storing of data being~~
22 ~~stored to said first data storage device or for initiating transmission~~
23 ~~of data from said sensing unit to said control unit, wherein said~~
24 ~~trigger signal is a real time change in information about the~~
25 ~~structure or live subject.~~

1 40. (Currently amended) A data collection apparatus, comprising a network of
2 addressable sensing units and a control unit, for attaching to at least one structure
3 or at least one live subject, said sensing units for sensing a parameter of ~~the at~~
4 ~~least one structure or at least one live subject~~, said sensing units each comprising a
5 sensor, an addressable microprocessor, a first data storage device connected to
6 said microprocessor, a first transmitting device and a first receiving device,
7 wherein said sensing units are configured so a real time signal from said control
8 unit to said sensing unit can trigger a change in one or more of the following: (a)
9 data handling, (b) data collection, and (c) data storage in said sensing unit, and (d)
10 sensor data transmission from said sensing unit.

1 41. (Currently amended) The apparatus as recited in claim 40, ~~further comprising a~~
2 wherein said control unit is separable from said sensing units, further wherein said
3 control unit comprising a second transmitter, comprises a second transmitter, a
4 second receiver, and a second data storage device for storing data received from
5 said ~~plurality of~~ sensing units.

1 42. (Currently amended) The apparatus as recited in claim 41, wherein ~~said control~~
2 ~~unit can transmit~~ second transmitter is connected to transmit address information
3 to activate all of said sensing ~~sensor~~ units, or to activate specific ones of said
4 sensing sensor units, or to activate one of said sensing units.

1 43. (Currently amended) The apparatus as recited in claim 41, wherein said control
2 unit can provide an address to query each ~~sensor~~ sensing unit individually.

1 44. (Previously presented) The apparatus as recited in claim 41, wherein said second
2 transmitting device is for transmitting a timing signal for synchronizing said
3 plurality of sensing units.

- 1 45. (Currently amended) The apparatus as recited in claim 40, wherein said
2 microprocessor can do one or more of the following: (a) query, (b) activate, or and
3 (c) send timing information to each sensor of said sensing unit individually, or to
4 and (d) activate all sensors at once.
- 1 46. (Currently amended) The apparatus as recited in claim 40, wherein said sensing
2 units further comprise a signal conditioner, an A/D converter, and a clock for
3 microprocessor functions and to track time.
- 1 47. (Currently amended) The apparatus as recited in claim 40, wherein said first data
2 storage device is connected to said first transmitting device for transmitting data
3 to said control unit when a signal triggering transmission is received.
- 1 48. (Previously presented) The apparatus as recited in claim 40, wherein said first
2 transmitter and said second transmitter are wireless transmitters.
- 1 49. (Currently amended) The apparatus as recited in claim 40, wherein each said
2 sensing unit further comprises comprising a triggering device for providing said
3 triggering modifying the storing of data being stored to said first data storage
4 device or for initiating transmission of data from said plurality of sensors to said
5 control unit, wherein said triggering device is controlled by a real time change in
6 information about the structure or live subject.

- 1 50. (Currently amended) A data collection apparatus, comprising:
- 2 a plurality of sensing units for attaching to ~~at least one structure or at least~~
3 ~~one live subject~~, said sensing units for sensing a parameter ~~of the at least~~
4 ~~one structure or at least one live subject~~, said sensing units each
5 comprising a sensor, a first data storage device, a first transmitting device
6 and a first receiving device; and
- 7
- 8 a control unit separable from said sensing units, said control unit
9 comprising a second transmitting device, a second receiving device, and a
10 second data storage device, for transmitting a timing signal for
11 synchronizing said plurality of sensing units, a second receiver, and a said
12 second data storage device for storing data received from said plurality of
13 sensing units, wherein each of said sensing units is configured so a real
14 time signal from said control unit to said sensing unit can trigger
15 transmitting data derived from said sensor by said first transmitting device.
- 1 51. (Currently amended) The apparatus as recited in claim 50, wherein said sensor
2 units are each further comprise an addressable microprocessor, and wherein said
3 ~~control unit~~ second transmitting device is further for transmitting timing and
4 address information to said sensor units.
- 1 52. (Currently amended) The apparatus as recited in claim 51, wherein said address
2 information is to activate all sensor units or to activate specific sensor units ~~based~~
3 ~~on the address of the individual sensor unit.~~
- 1 53. (Currently amended) The apparatus as recited in claim 51, wherein said control
2 unit can provide an address to query each sensor unit individually.

- 1 54. (Currently amended) The apparatus as recited in claim ~~50~~ 51, wherein said sensor
2 units each further comprise a microprocessor plurality of sensors wherein said
3 microprocessor can do one or more of the following: (a) query[[,]] each of said
4 sensors sensor individually (b) activate, or send timing information to each of said
5 sensors sensor individually, or to (c) query all said sensors at once and (d) activate
6 all said sensors at once.
- 1 55. (Cancel)
- 1 56. (Currently amended) The apparatus as recited in claim ~~54~~ 51, wherein said sensor
2 units each further comprise a signal conditioner[[,]] and an A/D converter, and a
3 clock.
- 1 57. (Currently amended) The apparatus as recited in claim ~~54~~ 51, wherein said
2 microprocessor controls storage to said first data storage device.
- 1 58. (Currently amended) The apparatus as recited in claim 50, wherein said first
2 transmitting device can transmit data from said first storage device to said control
3 unit.
- 1 59. (Currently amended) The apparatus as recited in claim ~~59~~ 50, wherein said second
2 data receiving device and second data storage device are for receiving and storing
3 said data transmitted to said control unit.
- 1 60. (Currently amended) The apparatus as recited in claim 50, wherein said first
2 transmitter transmitting device and said second transmitter transmitting device are
3 wireless transmitters.

- 1 61. (Currently amended) The apparatus as recited in claim 50, further comprising a
2 triggering device for ~~providing said triggering~~ ~~modifying the storing of data to~~
3 ~~said first data storage device or for initiating transmission of data from said~~
4 ~~sensing unit to said control unit, wherein said triggering device is controlled by a~~
5 ~~real time change in information about the structure or live subject.~~
- 1 62. (New) The apparatus as recited in claim 50, wherein each said sensing unit is
2 configured so data from said sensor can trigger transmission from said sensing
3 unit to said control unit.
- 1 63. (New) The apparatus as recited in claim 62, wherein said each said sensing unit is
2 configured to trigger transmission from said sensing unit to said control unit once
3 sensor data exceeds a threshold value.
- 1 64. (New) The apparatus as recited in claim 1, further comprising a host computer,
2 wherein said control unit is connected to said host computer.
- 1 65. (New) The apparatus as recited in claim 1, wherein a user operating on said host
2 computer can send a signal to trigger data collection.
- 1 66. (New) The apparatus as recited in claim 1, further comprising a triggering device
2 for providing said triggering.
- 1 67. (New) The apparatus as recited in claim 1, wherein said sensing unit is configured
2 so data from said sensor can trigger transmission from said sensing unit to said
3 control unit.

1 68. (New) The apparatus as recited in claim 67, wherein said sensing unit is
2 configured to trigger transmission from said sensing unit to said control unit once
3 sensor data exceeds a threshold value.

1 69. (New) The apparatus as recited in claim 2, wherein said sensor comprises an
2 angular accelerometer.

1 70. (New) The apparatus as recited in claim 2, wherein said sensor comprises a
2 piezoelectric accelerometer.

1 71. (New) The apparatus as recited in claim 13, wherein said microprocessor
2 comprises a triggering device for initiating transmission of data from said sensing
3 unit to said control unit, wherein said triggering device is controlled by a real time
4 change in said data.

1 72. (New) The apparatus as recited in claim 23, wherein said timing signal
2 synchronizes clocks on said sensing unit and on another apparatus.

1 73. (New) The method as recited in claim 39, wherein in said triggering step (d) said
2 triggering transmitting data step is provided by a trigger signal generated within
3 said sensing unit.

1 74. (New) The method as recited in claim 39, wherein in said triggering step (d) said
2 triggering transmitting data step is provided by a trigger signal received from said
3 control unit.

1 75. (New) The apparatus as recited in claim 40, wherein each said sensing unit is
2 configured so data from said sensor can trigger transmission from said sensing
3 unit to said control unit.

1 76. (New) The apparatus as recited in claim 75, wherein said each said sensing unit is
2 configured to trigger transmission from said sensing unit to said control unit once
3 sensor data exceeds a threshold value.

1 77. (New) The apparatus as recited in claim 1, wherein said first data storage device is
2 controlled by data received by said sensor.